CLAIMS

What is claimed:

1. A method, comprising:

measuring a test variable of a test layer formed on a test substrate in a processing chamber;

using the test variable to select a reference process condition in a consolidated data set of reference variables against reference process variables, a location of the reference process condition among the reference process variables depending on a location of the test variable among the reference variables; and

forming a process layer on a process substrate in a processing chamber, a process variable to form the process layer being based on the reference process condition.

2. The method of claim 1, wherein the test variable is indicative of growth rate of the test layer.

3. The method of claim 2, wherein the test variable is indicative of a length of a period of a signal from a pyrometer detecting infrared radiation from the test layer.

4. The method of claim 3, wherein the test variable is a length of a first period of the signal starting when the test layer begins to form.

5. The method of claim 1, wherein the process variable affects heat flux over a surface of the process substrate.

6. The method of claim 5, wherein the process variable is power which is provided to a heater.

7. A computer-implemented method, comprising:

measuring a test variable of a test layer formed on a test substrate in a processing chamber;

using the test variable to select a reference process condition in a consolidated data set of reference variables against reference process variables, a location of the reference process condition among the reference process variables depending on a location of the test variable among the reference variables; and

forming a process layer on a process substrate in a processing chamber, a process variable to form the process layer being based on the reference process condition.

8. The method of claim 7, wherein the process variable is computer-selected.

9. A method, comprising:

setting a heater to create a test heat flux over a test substrate in a substrate processing chamber;

forming a test layer on the surface while the heater creates the test heat flux over the surface of the test substrate;

comparing a test variable indicative of growth rate of the test layer with a reference variable indicative of growth rate of a reference layer when a reference heat flux is created over a surface of a reference substrate;

inserting a process substrate into the processing chamber;

setting the heater to create a process heat flux over a surface of the process substrate, the process heat flux being selected based upon the comparison of the test variable with the reference variable;

forming a process layer on the surface of the process substrate while the heater creates the process heat flux over the surface of the process substrate; and

removing the process substrate from the processing chamber after the process layer is formed.

10. A method comprising:

setting a heater to create a test heat flux over a surface of a test substrate in a processing chamber;

forming a test layer on the surface of the test substrate while the heater creates the test heat flux over the surface of the test substrate;

utilizing a pyrometer to detect infrared radiation from the test layer while the test layer is being formed, the pyrometer generating a signal varying with variations in magnitude of the infrared radiation;

calculating a test value indicative of a length of a period of the signal;

selecting a desired process value from data of different reference process values;

accessing a desired reference value from the data corresponding to the desired process value and differing from reference values corresponding to other ones of the process values;

comparing the test value with the desired reference value;

adjusting the heater based upon said comparison;

inserting a process substrate into the processing chamber, the heater heating the process substrate after said adjustment;

forming a process layer on the process substrate while being heated by the heater; and

removing the process substrate from the processing chamber into which the process substrate is inserted.

11. The method of claim 10, wherein the test layer is formed while maintaining

a test pressure and a concentration of a gas of a material out of which the test layer is formed at constant levels.

12. The method of claim 11, wherein a magnitude of the heat flux over the surface of the test substrate is maintained constant while forming the test layer.

13. The method of claim 10 wherein temperature of the surface of the test substrate remains constant while forming the test layer, the test layer having an emissivity that changes while the test layer is being formed.

14. The method of claim 10, wherein the pyrometer is located externally of the chamber in which the test substrate is located when the test layer is being formed, the chamber having a wall of a material through which the infrared radiation radiates.

15. The method of claim 10, wherein the test value is a length of time that it takes for the signal to return to an initial value a second time.

16. The method of claim 15, wherein the test value is a length of time of a first period of the test signal starting when the test layer begins to form.

17. The method of claim 16, wherein a magnitude of the signal increases when the degree of infrared radiation increases, and decreases when the degree of infrared radiation decreases.

18. The method of claim 10, wherein the different process values of the data are different power level settings.

19. The method of claim 10, wherein the test value and the reference value are compared to determine a difference between them.

20. The method of claim 10, wherein the test value is a length of a period of the signal and the heater is adjusted by either increasing heat flux from the heater if the test value is more than the desired reference value, or decreasing heat flux from the heater if the test value is less than the desired reference value.

21. The method of claim 10, further comprising:

compiling the data prior to forming the test layer on the test substrate.

22. The method of claim 21, wherein the data is compiled by repeatedly:

(i) inserting a reference substrate into a processing chamber;

(ii) adjusting a process variable to a reference process value;

(iii) forming a reference layer on the reference substrate;

(iv) calculating a reference value of the reference layer; and

(v) recording both the reference process variable and the reference value in a manner that relates them to one another.

23. A method, comprising:

using a temperature detector to detect a variable other than temperature of a test layer formed on a test substrate in a processing chamber; and

forming a process layer on a process substrate in a processing chamber, at least one processing condition to form the process layer being set based on the variable.

24. The method of claim 23, wherein the temperature detector does not detect a temperature of the process layer.

25. The method of claim 23, wherein the variable is indicative of a period of infrared radiation radiated by the test layer.